



# ***E-PATHFINDER***

An informal electronic newsletter published for the GPS user community by PM GPS. Information presented is based on published and submitted news items of interest to the general user. Widest dissemination and reproduction is encouraged. Newsworthy items are solicited for inclusion. Editor Mr. Don Mulligan at PM GPS, Ft Monmouth NJ DSN 992-6137 or (732) 532-6137 or email: [Donald.Mulligan1@us.army.mil](mailto:Donald.Mulligan1@us.army.mil)

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Website: <http://army-gps.robins.af.mil>

January 2006

*Pathfinder GPS Newsletter is now distributed via the web.*

## ***DAGR Passes Production Milestone*** ***Army-wide fielding continues through 2006 (story page 2)***

### ***PM's Corner***



This is the first issue of the PATHFINDER newsletter to be distributed via the internet.

Our newsletter objectives have not changed: Educate soldiers about GPS policy and technology and provide user-oriented information to support the operation and maintenance of GPS receivers.

We are in the process of updating the PM GPS website so it remains a good source of policy, operation and maintenance information for all GPS users.

The website will provide current information concerning receiver warranty repair procedures, Safety Messages, Maintenance Work Orders and practical tips for hand-held operation and vehicle installations.

We are always open to hearing from field users who have devised practical solutions to problems. Tell us what you've learned so we can share it with others.

Through 2006 and beyond, PM GPS will continue to field the handheld DAGR and promote the embeddable GPS receiver called GB-GRAM. These SAASM-based GPS receivers will carry precision Army navigation well into the next decade.

A couple of notes: Please read the letter from Colonel Ballenger on page 3 about commercial GPS receivers and check out the video identified on that page.

Also, some of the PM GPS team addresses and phone numbers have changed recently. Make note of the contact information provided in this newsletter.

If you have a question, it is important to us. If you don't find the answer at our website, contact us.

**H. Ray Matthews, Jr.**  
**LTC, AV**  
**PM, Global Positioning System**

### ***REMEMBER! PPS is not just GPS, It's SECURE GPS!***

*PPS stands for Precise Positioning Service, the secure GPS signal that can only be accessed by a military rated GPS receiver with current crypto keys!*

### ***SEE THE GPS VIDEO NOW!***

*Commercial GPS Receivers: Facts for the War-fighter, See the link to the video on page 3.  
Know the risks of using commercial GPS!*

## **DAGR (Defense Advanced GPS Receiver)**

**2005 Production Milestone: Over 40,000 DAGR Built to Date.**

### **Fielding Rolls On**

DAGR is the premiere military handheld GPS receiver today. The Army Materiel Release process recently endorsed DAGR and PM GPS continues the accelerated fielding schedule through 2006 towards a projected year end total of over 33,000 DAGR.

### **DAGR defined**

DAGR provides authorized DoD, Federal Civilian and Foreign Military Sales (FMS) users a lightweight, hand-held, dual frequency (L1/L2), Selective Availability Anti-Spoofing Module (SAASM) based, Precise Positioning Service (PPS) receiver.

DAGR is easy to use, reliable and accommodates a wide range of user skill levels. It supplements the predecessor hand-held military GPS receiver, the Precision Lightweight GPS Receiver (PLGR) and is interoperable with PLGR integrated platforms (adapters permissible).

The DAGR will eventually replace the PLGR. Like the PLGR, DAGR depot maintenance is provided by the manufacturer with field service limited to battery change out and self-test.

### **DAGR Fielding**

Fielding began in December 2004 at the 2nd Brigade, 82nd Airborne Infantry Division. As of January 2006, PM GPS has distributed over 28,000 DAGR with 15,000+ going to major unit fieldings for dismounted soldiers and 13,000+ to host platform managers for installation to a variety of Army weapons systems. DAGR is fielded under the "Total Package Fielding" concept wherein PM GPS provides DAGR, batteries, accessories during the equipment handoff.



**Dimensions 6.35" X 3.46" X 1.58" . Weight w/ batteries: less than 1 pound.**

### **DAGR New Equipment Training (NET)**

The comprehensive DAGR NET Program closely follows the DAGR Fielding Schedule to train personnel using the "Train the Trainer" concept.

Army PM GPS now has seven NET teams on the road. The Program of Instruction includes both classroom and Practical Exercise training periods. All DAGR NET instructors are current (National Guard) or former military personnel. They share lots of practical tips with each class, helping to make the most of DAGR. They also leave behind a package of training material to enable unit training personnel to conduct additional NET courses once the PM GPS team has moved on. As of January 2006, over 1,700 soldiers have attended the full "Train the Trainer" DAGR NET program.

PM GPS has placed the DAGR Computer Based Training (CBT) package on the US Army Training Support Center Website (Reimer Digital Library). Go to <http://www.train.army.mil>. Click on Library search and enter the word DAGR for keyword search. Then click on CD11-64 to execute the DAGR program.

### **DAGR Production & Operations**

The DAGR production line will remain busy through 2006 with Army orders. Product improvements will be kept to a minimum and only made as needed. DAGR product improvements do not affect the ability to use either the AN/PSN-13 or AN/PSN-13A models interchangeably for most missions.

During 2005, a DAGR product improvement installed the new version of SAASM security. In 2006, DAGR will get new software to update the World Magnetic Model (WMM) reference data (GPS receivers use the WMM to calculate position). A field software upgrade will be distributed via the usual MWO and TCTC processes so users can upgrade previously issued DAGR to the same software version.

DAGR PM: DSN 633-3678

### **CURRENT DAGR SOFTWARE**

**(As of January 2006)**

**AN/PSN-13 984-2461-011**

**AN/PSN-13A 984-3006-001**

Memorandum addressed to military commands world-wide



**DEPARTMENT OF THE AIR FORCE**  
HEADQUARTERS SPACE AND MISSILE SYSTEMS CENTER (AFSPC)  
LOS ANGELES AIR FORCE BASE, CALIFORNIA

MEMORANDUM FOR SEE DISTRIBUTION

19 JUL 2005

FROM: SMC/GP  
2420 Vela Way, Suite 1866  
El Segundo, CA 90245-4659

SUBJECT: Commercial GPS Receiver: Facts for the Warfighter DVD

1. American warfighters and our allies have used navigation devices based on the Navstar Global Positioning System (GPS) to prevail in combat situations from Operation DESERT STORM in 1991 to the Afghan and Iraqi campaigns of today. Our fighting forces continue to find new and innovative ways to exploit the asymmetrical advantage of GPS.
2. The growing use of GPS brings a growing risk as well. Warfighters need to know the difference between the secure, military-grade GPS units and commercially available civil-grade units. Using a commercial GPS device in a war zone without understanding its fundamental limitations can lead to friendly-fire casualties, collateral damage, or worse.
3. The enclosed 10-minute DVD entitled, "Commercial GPS Receivers: Facts for the Warfighter" outlines some of the risks of using commercial GPS receivers for combat operations. The DVD is approved for public release, and should be shared with warfighters, trainers, policymakers, and anyone who has to make a decision about how to use GPS in a combat situation.
4. All GPS devices can be valuable aides to the men and women of our armed services, if used properly. This DVD will help you and those who count on you to make informed decisions when using GPS.
5. To obtain additional copies, or for more information please contact the Navstar GPS Joint Program Office at (310) 363-1526; DSN: 833-1526.

WESLEY A. BALLENGER, JR., Col, USAF  
System Program Director  
Navstar GPS Joint Program Office

Attachment:  
Commercial GPS Receiver: Facts for the Warfighter DVD

GUARDIANS OF THE HIGH FRONTIER

***"Every war-fighter needs to know  
the risks associated with using commercial GPS on the battlefield"***  
***View the video at <http://www.jcs.mil/j6/GPSwarfighter.wmv>***

## ***PLGR News in 2006***

The workhorse PLGR soldiers on with over 100,000 units in service. Although it is being displaced by the newer lighter DAGR, PLGR remains a reliable GPS receiver and with an active COMSEC key it still outperforms most commercial GPS receivers.

PM GPS continues to support PLGR from both the Warner Robins Georgia and the Fort Monmouth New Jersey Field Offices.

Anything new with PLGR in 2006? Yes! Two actions are pending: The first is a software update that will affect all PLGR users and the second is a new accessory item that only applies to certain users.

About the software update: The USAF and Army PM GPS will distribute a PLGR software upgrade using the usual TCTO and MWO channels in 2006. The purpose of the software update is to load new World Magnetic Model (WMM) reference data. (GPS receivers use WMM to calculate position). You will be able to obtain the software from the RDIT website at: <https://rdit.army.mil/gps>. Then use your PLGR reprogramming kit to load the software to your PLGR.

About the new accessory: The External Protection Module or EPM was developed to protect electronic devices connected to PLGR such as the FBCB2 laptop computer. It became clear that in some situations, a power surge could damage PLGR or the connected



***The PLGR External Protection Module (shown above and installed to PLGR at right) fits onto the back of PLGR and provides the same data ports, but with additional circuitry protections.***

equipment where users “hot-swap” the PLGR or have incorrectly wired the external power cable. The EPM is intended to avoid this damage.

During 2005, PM GPS ordered 9,500 EPMs in order to establish depot stock. Affected host platform managers know who they are and can requisition the EPM as needed. Individual PLGR users may requisition the EPM through supply channels.

If you have questions about PLGR software or whether or not you need the PLGR EPM, contact the Georgia Field Office listed in this newsletter.

## ***Ground-Based GPS Receiver Applications Module (GB-GRAM)***

GB-GRAM is a circuit card weighing less than four ounces and containing a full-feature military capable GPS receiver. It is a performance equivalent to the GPS receiver contained in the handheld DAGR!

GB-GRAM is designed to be embedded into ground-mobile weapons systems and low dynamic aircraft including Unmanned Aerial Vehicles. As of Jan 2006, weapons system managers have ordered over 8,000 GB-GRAM for installation to host platforms. The GB-GRAM application to MTS illustrated elsewhere in this issue is a typical example of how GB-GRAM can provide a SAASM-based GPS solution. Over 40 weapon system integrators are using the GB-GRAM as their cost-effective military GPS solution. PM GRAM even has a new accessory that could allow one GB-GRAM to replace up to three handheld receivers in a host platform! Call to learn more about the “DASH box”.

For more information, contact PM GB-GRAM at DSN 633-3749 or Commercial (310) 653-3749.



***GB-GRAM is a state-of-the-art SAASM-based GPS receiver on a circuit card measuring 3.5 by 2.5 inches and weighing about 4 ounces.***

## Feedback from the DAGR Maintenance Shops

### DAGR Windows Scratched?

During 2005 a number of DAGR were returned for repair due to deep scratches in the display window.

Small scratches are inevitable with wear and tear of normal operations but some may be preventable: Item 3 in the Preventive Maintenance Checks & Services checklist, Table 21 of the DAGR O&M Manual (reference below) advises the user to check the display surface for scratches, cracks and nicks. If scratches hinder the view of information displayed, turn in the DAGR for repair.

Here are some preventive tips about storing DAGR. When storing loose DAGRs, the memory battery cover screws of one DAGR might scratch the display window of another. Avoid that situation and you may avoid the scratches that make a display unreadable and render a DAGR unserviceable.

We suggest:

- Use the padded Fast Pack Boxes that were provided during DAGR fielding.
- If you tossed the Fast Pack Boxes, use the DAGR personnel case issued as Basic Issue Item (BII) during fielding to store DAGRs.
- If you don't have boxes or cases for individual storage, place loose DAGR with display windows facing each other to avoid screws-to-display window contact.

PM GPS is monitoring this situation in coordination with DCMA and Rockwell. If you have any questions, please contact PM DAGR at DSN 633-3678 or Fort Monmouth at DSN 992-4733.

Reference DAGR TM: TO 31R4-2PSN13-1, TM 11-5820-1172-13, dated 1 March 2005, with Change One dated 1 Jun 2005.

### DAGR Vent Holes Clogged? Be Careful about Clearing Them!

Did you notice that your DAGR has small breather vents underneath the prime and memory battery compartment covers and a third one in the DAGR body under the memory battery cover? From the outside they are pin holes. From the inside you will see "white dots" (see illustration at right)

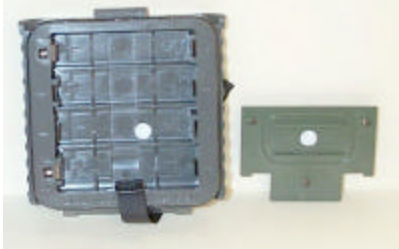
The purpose is to relieve internal pressure that may build when DAGR heats up, for example if left in direct sunlight for an extended period. If your DAGR has a distorted or bulging keypad, that may be an indicator of internal pressure that is not being relieved. Your vents may be clogged. Check it out - carefully!

Item 10 in the DAGR Preventive Maintenance Checks & Services checklist, Table 21-1 suggests that you gently flush the external surface with water to clear dirt from the vents. If that doesn't do the trick, resist the urge to stick a sharp object into the vent because you will puncture the filter that makes your DAGR water resistant. Each vent is covered by a 1/4 inch diameter paper diaphragm which looks like coffee filter

paper. This filter lets air pressure out but does not let moisture in. Further efforts to open a clogged vent are not user-serviceable actions and the DAGR should be returned for depot repair.

DAGR vents are discussed in the DAGR O&M Manual. See the Caution on page xxvi and the Caution and the Note on page 22-1. (The DAGR TM is identified in the above article).

PM GPS is monitoring this situation in close coordination with DCMA and Rockwell. If you have any questions, please contact the DAGR PM at DSN 633-3678 or the Fort Monmouth Field Office at DSN 992-4733.



*The small (1/4" diameter) white circles are the DAGR vents. At top, the DAGR body vent is just left of the memory battery. At left are the inside of the prime and memory battery covers. Note the actual vent holes are smaller than the "paper" diaphragm covering them. You can carefully clean the outside but avoid puncturing the membrane that keeps DAGR water resistant!*

### ***Recent GPS Articles in PS Magazine:***

The Preventive Maintenance Monthly, better known as "PS Magazine" is published by the AMC Logistics Support Activity at Redstone Arsenal, AL.

The January 2006 issue includes two articles of interest to GPS users.

One article advises about the use of correct memory batteries in PLGR. Just because a 1.5V AA battery fits in the memory battery cavity doesn't mean it is an acceptable substitute for the specified 3.6V AA memory battery!

The other article provides information about the need to maintain a clear line-of-sight from a GPS antenna to the GPS satellites. This is especially important when using a GPS receiver inside a moving vehicle. The article addresses the most common vehicle PLGR installation, the HMMWV, but it also provides a Point of Contact for information about installing PLGR in other vehicles. You can refer back to this source in the future as DAGR vehicle installation designs become available.

If you can't find a copy of PS Magazine Issue # 638, January 2006 in your unit area, you can get it on line. Visit the LOGSA website at:

<https://www.logsa.army.mil/psmag/psonline.cfm>

### ***PM GPS Technical Help Via Email***

Go to the PM GPS Web Home Page at

<http://army-gps.robins.af.mil/>.

Click on the link labeled **Technical Support**.

Then click on the link labeled **technical support team**.

This will automatically open a blank email addressed to the entire Ground Receivers Team at the PM GPS Georgia Field Office, Joint Service System Management Office (JSSMO) at Warner Robins AFB.

Just type your question in, hit the send button. Most questions are answered within 24 hours.

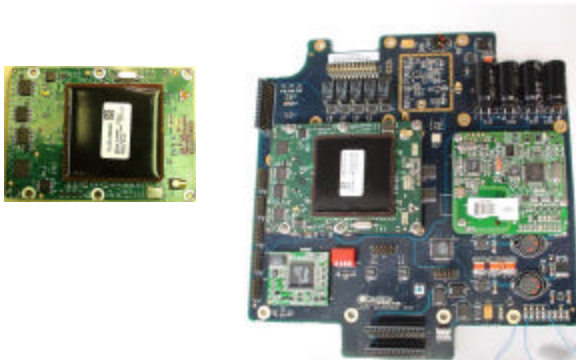
If you are requesting electronic copies of manuals or copy of an ICD, you will get faster response if your email is coming from a .mil address.

Otherwise, we will have to verify your need to know before we can provide the information.

Our mission at the Georgia Field Office is to provide the support you need. Contact us at DSN 468-1109

### ***GB-GRAM applied to the MOVEMENT TRACKING SYSTEM***

*The GB-GRAM is shown (below left), and installed to the MTS mother board (center). The mother board in turn is mounted inside the MTS navigation box (right) which is a Line Replaceable Unit (LRU) component of the MTS system. The weatherproof MTS box is then mounted to a variety of cargo vehicles such as the Family of Medium Tactical Vehicles (FMTV) cargo truck to provide "real-time" movement tracking of the vehicle utilizing the GB-GRAM for a military-rated source of GPS positioning data.*



*(Not to scale)*



## ***How to Contact PM GPS***

### **Product Management Office (PMO) Ft Monmouth NJ**

LTC Ray Matthews, PM GPS  
(732) 532-3169 DSN 992-3169  
horace.matthews@mail1.monmouth.army.mil

Mr. Chris Manning  
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Mr. Ed McAuley  
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**Army Program Manager (GPA) at the Navstar GPS**  
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Mr. David Williamson, Deputy PM GPS  
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**Georgia Field Office (GFO) Warner Robins GA**

Mr. Frank Rowe, Chief  
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Mr. William Burnette  
(478) 926-1109, DSN 468-1109  
william.burnette@robins.af.mil

### **Who to Call?**

For platform integration and new product information, call the Deputy PM at Los Angeles.

For equipment authorization, maintenance status, fielding, and NET, call the PMO.

For sustainment issues including software, supply, technical publications, accessories and host vehicle installations, call the GFO.

Not Sure? Contact one of our Help Lines:

***William Burnette in Georgia at DSN 468-1109 or CML (478) 926-1109 William.burnette@robins.af.mil***

***Jim Buggy in NJ at DSN 992-4733, CML (732) 532-4733 james.buggy@mail1.monmouth.army.mil.***

***Visit the PM GPS WEBSITE:  
<http://army-gps.robins.af.mil>***

***January 2006***